

## **AMENDMENTS TO THE CLAIMS**

This listing of claims replaces all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

1. (Previously Presented) In a computing system that includes one or more processors, persistent media configured to store information that persists through power loss of the computing system, and system memory that is directly accessed by the one or more processors, the computing system having applications running multiple instances of the application, the instances of the application having both a normal mode and a recovery mode, a method for permitting an instance of an application to operate in recovery mode while ensuring reliable message processing for messages received during the recovery mode operations of the instance governing a transaction, wherein a transaction is an exchange of messages following a particular message exchange pattern with a particular client system, the method comprising the following:

a step for the computing system engaging in multiple concurrent transactions with at least one client computing system, wherein each of the multiple transactions has an associated instance of an application, each instance having an associated mode distinct from the mode of the other instances;

an act of receiving a message corresponding to a particular message transaction from among the multiple transactions, wherein the message is a normal message suitable for normal mode operations with respect to the particular message transaction and an instance of an application governing the particular message transaction is in the recovery mode rather than the normal mode;

upon receiving the message, an act of determining from state information corresponding to the particular message transaction that the instance of an application governing the particular message transaction is in the recovery mode rather than the normal mode;

an act of determining that the received message is a normal message suitable for normal mode operations with respect to the particular message transaction, wherein the received message cannot be processed by the instance governing the particular message transaction until the instance governing the particular message transaction is in the normal mode;

an act of placing the received message into a persistent queue associated with the instance governing the particular transaction for later processing when the instance governing the

particular transaction is in the normal mode rather than the recovery mode, wherein messages related to other transactions continue to be processed if they are in the normal mode; and

an act of completing recovery mode operation for the instance governing the particular transaction.

2. (Previously Presented) The method in accordance with Claim 1, further comprising the following:

an act of loading the state information from persistent media into system memory in response to the act of receiving the message.

3. (Previously Presented) The method in accordance with Claim 1, further comprising the following:

an act of saving the state information into persistent media after the act of placing the message into the persistent queue.

4. (Previously Presented) The method in accordance with Claim 1, wherein the message is a first message, the method further comprising the following:

an act of receiving a second message corresponding to the particular message transaction;

upon receiving the second message, an act of determining from state information corresponding to the particular message transaction that the instance governing the state information is still in the recovery mode rather than the normal mode;

an act of determining that the second message is a recovery message suitable for recovery mode operations and not suitable for normal mode operations; and

an act of processing the recovery message.

5. (Previously Presented) The method in accordance with Claim 4, further comprising the following:

an act of loading the state information from persistent media into system memory in response to the act of receiving the second message.

6. (Previously Presented) The method in accordance with Claim 4, further comprising the following:

an act of saving the state information into persistent media after the act of processing the recovery message.

7. (Previously Presented) The method in accordance with Claim 4, further comprising the following:

an act of determining that the processing of the recovery message completes recovery of the instance governing the particular message transaction.

8. (Previously Presented) The method in accordance with Claim 7, further comprising the following:

an act of setting the state information to reflect normal operation mode, wherein the act of saving the state information into persistent media after the act of processing the recovery message occurs after the act of setting the state information to reflect normal operation mode.

9. (Previously Presented) The method in accordance with Claim 8, further comprising the following:

an act of processing one or more normal messages in the queue in response to the act of determining that the processing of the recovery message completes recovery of the instance governing the particular message transaction.

10. (Previously Presented) A computer program product for use in a computing system that includes one or more processors, persistent media configured to store information that persists through power loss of the computing system, and system memory that is directly accessed by the one or more processors, the computing system having applications running multiple instances of the application, the instances of the application having both a normal mode and a recovery mode, the computer program product for implementing a method for permitting an instance of an application to operate in recovery mode while ensuring reliable message processing for messages received during the recovery mode operations of the instance governing a transaction, wherein a transaction is an exchange of messages following a particular message exchange pattern with a particular client, the computer program product comprising one or more computer-readable storage media having stored thereon computer-executable instructions that, when executed by the one or more processors, cause the computing system to perform the following:

a step for the computing system engaging in multiple concurrent transactions with at least one client computing system, wherein each of the multiple transactions has an associated instance of an application, each instance having an associated mode distinct from the mode of the other instances;

an act of receiving a message corresponding to a particular message transaction from among the multiple transactions, wherein the message is a normal message suitable for normal mode operations with respect to the particular message transaction and an instance of an application governing the particular message transaction is in a recovery mode rather than a normal mode;

upon receiving the message, an act of determining from state information corresponding to the particular message transaction that the instance of an application governing the particular message transaction is in recovery mode rather than the normal mode;

an act of determining that the received message is a normal message suitable for normal mode operations with respect to the particular message transaction, wherein the message cannot be processed by the instance governing the particular message transaction until the instance governing the particular message transaction is in the normal mode;

an act of placing the received message into a persistent queue associated with the instance governing the particular transaction for later processing when the instance governing the

particular transaction is in the normal mode rather than the recovery mode, wherein messages related to other transactions continue to be processed if they are in the normal mode; and

an act of completing recovery mode operation for the instance governing the particular transaction.

11. (Previously Presented) The computer program product in accordance with Claim 10, wherein the one or more computer-readable storage media comprise physical memory media.

12. (Previously Presented) The computer program product in accordance with Claim 11, wherein the physical memory media comprises persistent media.

13. (Previously Presented) The computer program product in accordance with Claim 11, wherein the physical memory media comprises system memory.

14. (Previously Presented) The computer program product in accordance with Claim 10, wherein the one or more computer-readable storage media further have stored thereon computer-executable instructions that, when executed by the one or more processors, cause the computing system to further perform the following:

an act of loading the state information from persistent media into system memory in response to the act of receiving the message.

15. (Previously Presented) The computer program product in accordance with Claim 10, wherein the one or more computer-readable storage media further have stored thereon computer-executable instructions that, when executed by the one or more processors, cause the computing system to further perform the following:

an act of saving the state information into persistent media after the act of placing the message into the persistent queue.

16. (Previously Presented) The computer program product in accordance with Claim 10, wherein the message is a first message, and the one or more computer-readable storage media further have stored thereon computer-executable instructions that, when executed by the one or more processors, cause the computing system to further perform the following:

an act of receiving a second message corresponding to the particular message transaction;

upon receiving the second message, an act of determining from state information corresponding to the particular message transaction that the instance governing the state information is still in the recovery mode rather than the normal mode;

an act of determining that the second message is a recovery message suitable for recovery mode operations and not suitable for normal mode operations; and

an act of processing the recovery message.

17. (Previously Presented) The computer program product in accordance with Claim 16, wherein the one or more computer-readable storage media further have stored thereon computer-executable instructions that, when executed by the one or more processors, cause the computing system to further perform the following:

an act of loading the state information from persistent media into system memory in response to the act of receiving the second message.

18. (Previously Presented) The computer program product in accordance with Claim 16, wherein the one or more computer-readable storage media further have stored thereon computer-executable instructions that, when executed by the one or more processors, cause the computing system to further perform the following:

an act of saving the state information into persistent media after the act of processing the recovery message.

19. (Previously Presented) The computer program product in accordance with Claim 16, wherein the one or more computer-readable storage media further have stored thereon computer-executable instructions that, when executed by the one or more processors, cause the computing system to further perform the following:

an act of determining that the processing of the recovery message completes recovery of the instance governing the particular message transaction.

20. (Previously Presented) The computer program product in accordance with Claim 19, wherein the one or more computer-readable storage media further have stored thereon computer-executable instructions that, when executed by the one or more processors, cause the computing system to further perform the following:

an act of setting the state information to reflect normal operation mode, wherein the act of saving the state information into persistent media after the act of processing the recovery message occurs after the act of setting the state information to reflect normal operation mode.

21. (Previously Presented) The computer program product in accordance with Claim 20, wherein the one or more computer-readable storage media further have stored thereon computer-executable instructions that, when executed by the one or more processors, cause the computing system to further perform the following:

an act of processing one or more normal messages in the queue in response to the act of determining that the processing of the recovery message completes recovery of the instance governing the particular message transaction.

22. (Previously Presented) In a computing system that includes one or more processors, persistent media configured to store information that persists through power loss of the computing system, and system memory that is directly accessed by the one or more processors, the computing system having applications running multiple instances of the application, the instances of the application having both a normal mode and a recovery mode, a method for permitting an instance of an application to operate in recovery mode while ensuring reliable message processing for messages received during the recovery mode operations of the instance governing a transaction, wherein a transaction is an exchange of messages following a particular message exchange pattern with a particular client system, the method comprising the following:

- a step for the computing system engaging in multiple concurrent transactions with at least one client computing system, wherein each of the multiple transactions has an associated instance of an application, each instance having an associated mode distinct from the mode of the other instances;

- an act of receiving a message corresponding to a particular message transaction from among the multiple transactions, wherein the message is a normal message suitable for normal mode operations with respect to the particular message transaction and an instance of an application governing the particular message transaction is in the recovery mode rather than the normal mode;

- upon receiving the message, an act of determining from state information corresponding to the particular message transaction that the instance of an application governing the particular message transaction is in the recovery mode rather than the normal mode;

- while the instance governing the particular message transaction is in a recovery mode, an act of receiving a second message corresponding to a second message transaction, wherein the message is a normal message suitable for normal mode operations with respect to the second message transaction and a second instance governing the second message transaction is in a normal mode rather than a recovery mode;

- an act of the second instance governing the second message transaction processing the message; and

- a step for recovering while preserving received normal messages corresponding to the particular message transaction for use in normal mode.



23. (Previously Presented) The method in accordance with Claim 22, wherein the step for recovering while preserving such messages comprises the following:

an act of determining that the received message is a normal message suitable for normal mode operations, wherein the instance cannot process the normal message when the instance is in the recovery mode;

an act of placing the received message into a persistent queue for later processing when the instance is in the normal mode rather than the recovery mode; and

an act of completing recovery mode operation.